

18th Space Control Squadron

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Small Satellite Support

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Awareness (SSA) Sharing Team
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“Semper Supra”





- Who We Are, What We Do, What We Share
- CubeSat Coordination
 - Finding you
 - Identifying your satellite
 - www.Space-Track.org
- How YOU Can Help

www.Space-Track.org
18SPCS.doo.customerservice@us.af.mil

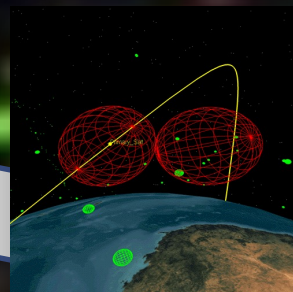




18th Space Control Squadron Mission

TRACK

- Space Surveillance Network
Sensors deployed across the globe & in space
- Satellite Catalog maintenance



IDENTIFY

- On-orbit Conjunction Assessment & Collision Avoidance
- Deorbit & Reentry Assessment
- Spacecraft End of Life/Disposal
- Breakup Processing
- Advanced/Specialized Analysis



ENGAGEMENT & SUPPORT

- Human Spaceflight Safety: including the International Space Station
- U.S. Interagency & Allies
- SSA Sharing Agreement Holders
- Small Satellite Owners
- *Space-Track.org* Users

DETECT

- Launch Screening (Conjunction Assessment & Collision Avoidance)
- Early Orbit Determination





Satellite Catalog on www.space-track.org

NORAD CAT ID	SATNAME	INTLDES	TYPE	COUNTRY	LAUNCH	SITE	DECAY	PERIOD	INCL	APOGEE	PERIGEE	RCS	TLE
1	SL-1 R/B	1957-001A	ROCKET BODY	CIS	1957-10-04	TTMTR	1957-12-01	96.19	65.10	938	214	LARGE	TLE OMM
2	SPUTNIK 1	1957-001B	PAYLOAD	CIS	1957-10-04	TTMTR	1958-01-03	96.10	65.00	945	227		TLE OMM
3	SPUTNIK 2	1957-002A	PAYLOAD	CIS	1957-11-03	TTMTR	1958-04-14	103.74	65.33	1659	211	SMALL	TLE OMM
4	EXPLORER 1	1958-001A	PAYLOAD	US	1958-02-01	AFETR	1970-03-31	88.48	33.15	215	183		TLE OMM
5	VANGUARD 1	1958-002B	PAYLOAD	US	1958-03-17	AFETR		132.74	34.25	3834	650	MEDIUM	TLE OMM
6	EXPLORER 3	1958-003A	PAYLOAD	US	1958-03-26	AFETR	1958-06-28	103.60	33.50	1739	117		TLE OMM
7	SL-1 R/B	1958-004A	ROCKET BODY	CIS	1958-05-15	TTMTR	1958-12-03	102.74	65.14	1571	206		TLE OMM
8	SPUTNIK 3	1958-004B	PAYLOAD	CIS	1958-05-15	TTMTR	1960-04-06	88.43	65.06	255	139	LARGE	TLE OMM
9	EXPLORER 4	1958-005A	PAYLOAD	US	1958-07-26	AFETR	1959-10-23	92.81	50.25	585	239		TLE OMM
10	SCORE	1958-006A	PAYLOAD	US	1958-12-18	AFETR	1959-01-21	98.21	32.29	1187	159		TLE OMM
11	VANGUARD 2	1959-001A	PAYLOAD	US	1959-02-17	AFETR		121.46	32.87	2939	553	MEDIUM	TLE OMM
12	VANGUARD R/B	1959-001B	ROCKET BODY	US	1959-02-17	AFETR		125.86	32.90	3326	556	MEDIUM	TLE OMM
13	DISCOVERER 1	1959-002A	PAYLOAD	US	1959-02-28	AFWTR	1959-03-03	92.70	90.00	697	114		TLE OMM
14	DISCOVERER 2	1959-003A	PAYLOAD	US	1959-04-13	AFWTR	1959-04-26	90.40	89.90	346	239		TLE OMM
15	EXPLORER 6	1959-004A	PAYLOAD	US	1959-08-07	AFETR	1961-06-30	762.25	46.95	42276	251		TLE OMM





Conjunction Assessment Services (No Cost)

- Conjunction Assessment
 - We screen all objects we're tracking against each other (satellites, rocket bodies, debris – roughly 27,000 pieces)
 - If we have contact information for a satellite owner/operator, we provide conjunction assessment information to them automatically
 - If your satellite's involved, we'll tell you!
- We create more than 180,000 "Conjunction Data Messages" daily
- If it's really close, we'll call you – wherever you are (rare)





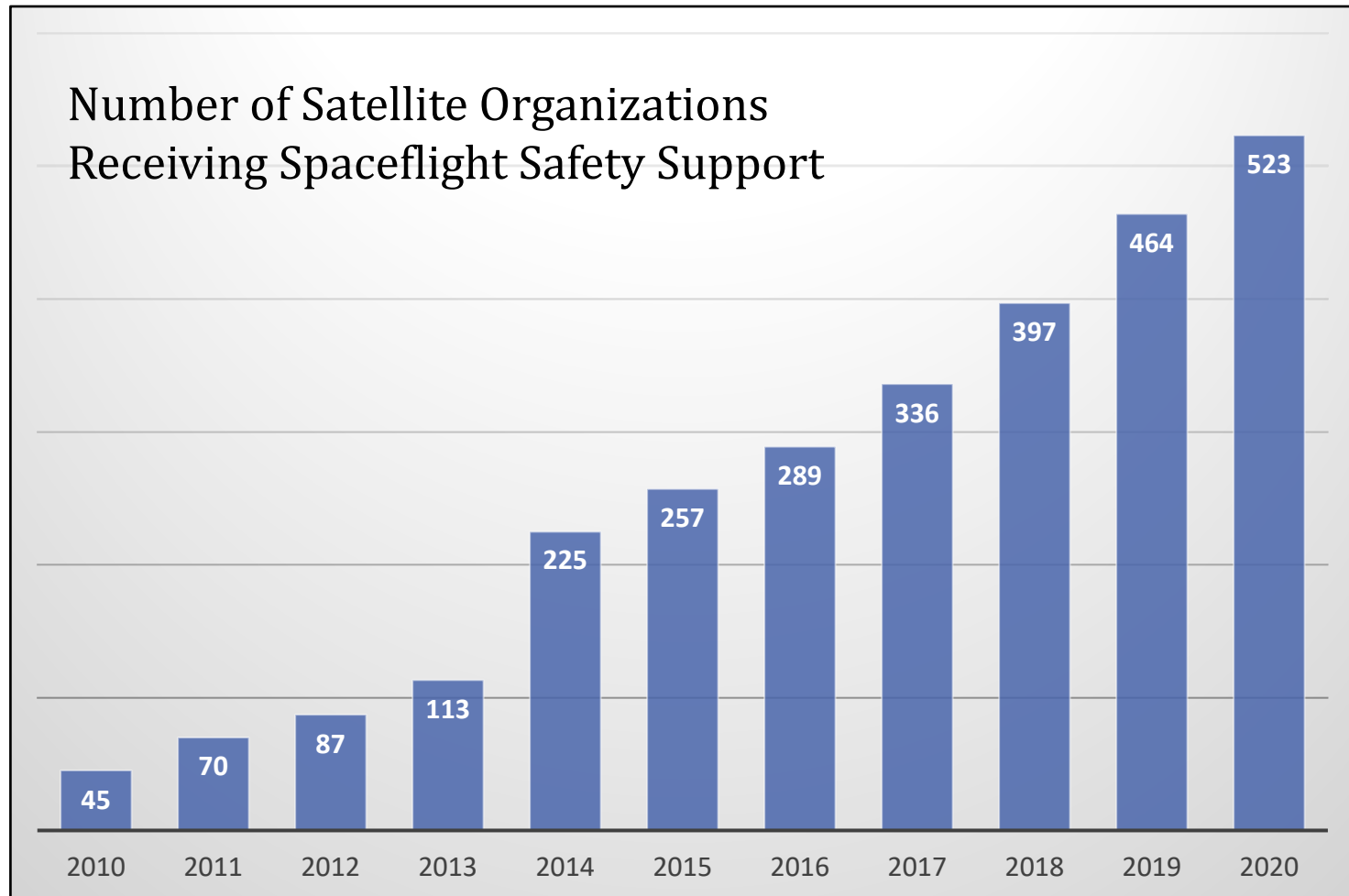
Space Situational Awareness Sharing

- Basic services are available to any person or organization with an account on www.space-track.org
- What we can do:
 - Provide high accuracy data and support at no cost
 - Facilitate communication and cooperation
- What we can't do:
 - Recommend courses of action
 - Tell an operator what to do
- Having “public” contact info in Space-Track allows easy coordination with other satellites owner/operators





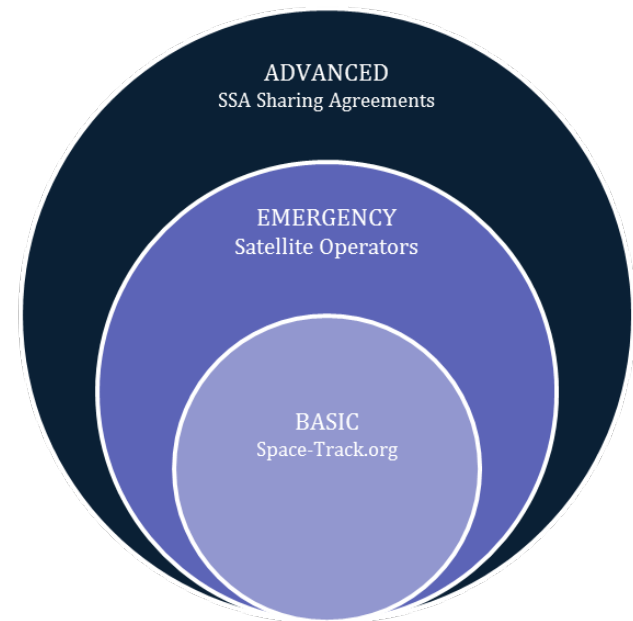
SSA Sharing Statistics





Advanced Services

- Beyond the basic TLEs and conjunction assessment, more advanced services can be requested. For example, historic data pulls, or increased screening volumes
- If it's a one-time situation, you can submit an "Orbital Data Request" (available on Space-Track.org)
- If you're interested in long-term advanced support, consider getting an "SSA Sharing Agreement" with the U.S. Space Command (we can introduce you to the right people)
- It's still all at no cost





Forging Our Relationship

- Register on www.Space-Track.org
 - Fill out the (easy, one page) small satellite registration form, available on the Space-Track welcome page
- Contact us at 18SPCS.doo.customerservice@us.af.mil
 - Let us know about your launch and your satellite
 - Provide contact information for your operators
 - We'll set up an organization account and link the appropriate people to it
 - Once your satellite is identified, it'll also be linked to the account
- We'll work with you to identify your satellite after launch
- Once on orbit, we'll track your satellite and provide orbital info (TLEs) daily
- We'll alert you if any other object gets close to your satellite (Conjunction Assessment)





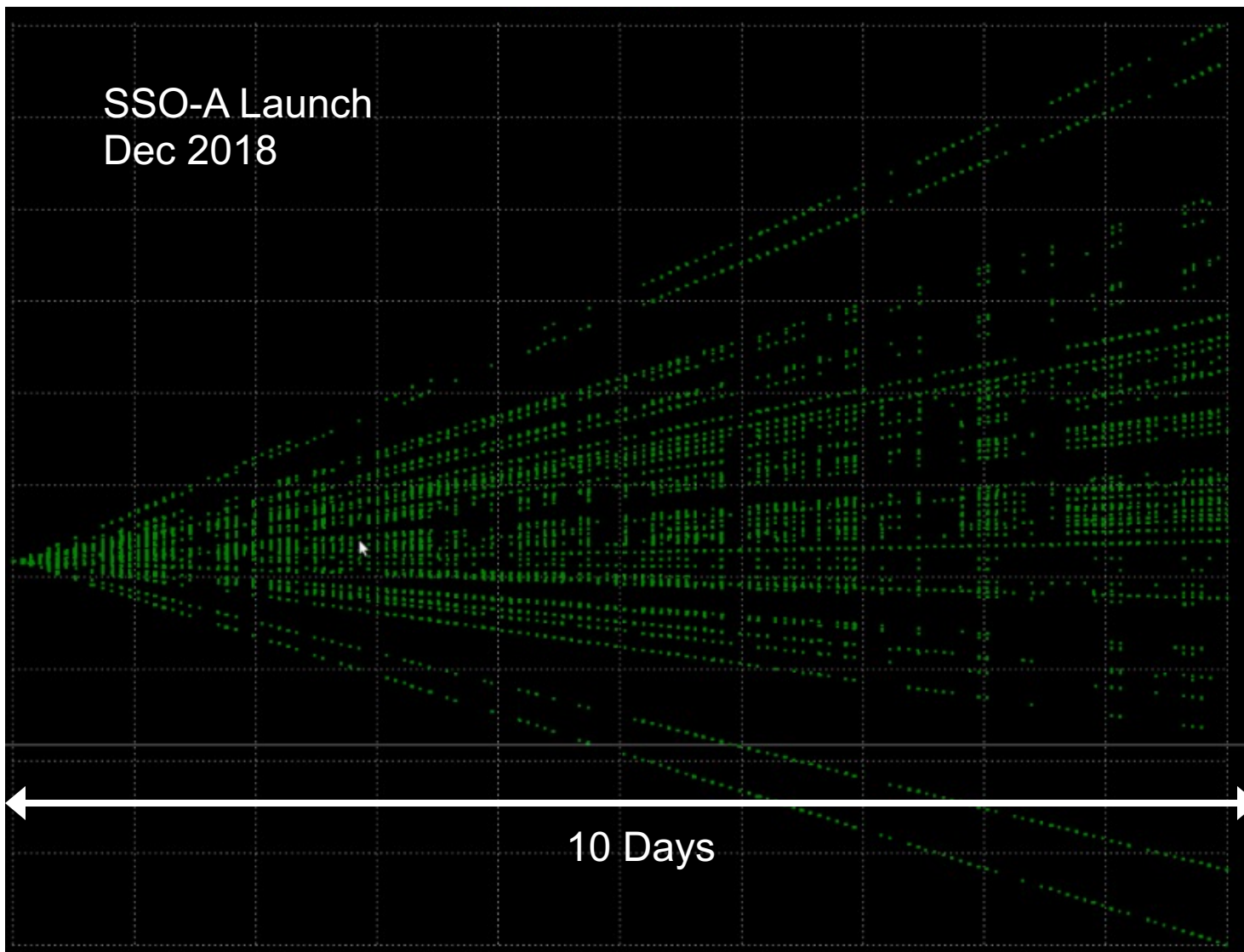
Multi-Payload Launch Coordination

- TLEs are published in the public catalog when we have enough tracking data and the TLEs are judged to be good quality
 - At first, they may be named OBJECT A, OBJECT B, etc.
- We rely on you, the small satellite owner, to tell us which object is your satellite
 - Better signal equals more likely match
- Be patient! For single satellite launches, we'll have it catalogued within a day or two, but multi-payload launches can take days





Identifying Your Satellite After Launch





How Can You Help?

- Mission Design Considerations
 - Consider human life: below the ISS is safer
 - Higher inclination orbits are better tracked
 - Is it big enough to be seen for tracking? (>1U in LEO is optimal: if you're not sure, we recommend a tracking enhancement device)
 - Recommend using a unique satellite name (check Space-Track)
- Register on www.Space-Track.org
 - Fill out the SmallSat registration form
 - Contact us (18SPCS.doo.customerservice@us.af.mil), send us basic information about your satellite and the launch it'll be on
- On-Orbit
 - Tell us which one is yours after launch
 - If you've got propulsion, let us know before maneuvering
 - Let us know when your satellite has reached end of mission





Conclusion

If you're launching in the next few months, or if you have any questions, we'd be happy to talk with you!

18SPCS.doo.customerservice@us.af.mil

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And don't forget www.Space-Track.org

